DRAFT

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SUPPORTING INFORMATION TECHNOLOGY INFRASTRUCTURE FOR CALIFORNIA MENTAL HEALTH SYSTEM ACCOUNTABILITY

Integrating Data Project Silos and Increasing Performance Measurement Capacity Through A Comprehensive Electronic Mental Health Technology Enterprise

BACKGROUND

The California mental health system has been charged with numerous responsibilities both through the Mental Health Services Act and the President's New Freedom Commission on Mental Health. These include the responsibilities to:

- Reduce stigma and increase knowledge and understanding of mental health as an essential component of overall health
- To provide mental health services/supports that are client and family driven, recovery and wellness oriented, culturally competent, and that address the needs of diverse populations without disparities
- To provide early screenings, assessments and appropriate referrals,
- To deliver modern, science-based mental health care
- To accelerate mental health research and evaluation
- To use modern technologies for information gathering and dissemination - in order to improve mental health services/supports access, service coordination and record keeping, system evaluation and decision support.

The fulfillment of these responsibilities has the potential to transform the mental health system and lead to lasting recovery and wellness for people and communities.

The mental health system must be accountable. Accountability with regard to mental health service delivery means that the mental health system is liable for providing an account of those things that demonstrate its progress/success in meeting its responsibilities, e.g., the system's service structure, capacity, unmet mental health services need, prevention efforts, financial, administrative and clinical practices, providers, treatment recipients, performance measures, client outcomes, etc. In short, in order to be accountable, the mental health system must describe and evaluate itself, and be able to collect and compile the information to do so.

Therefore, demonstration that the mental health system is meeting its responsibilities relies considerably on data, and accurate and meaningful ways of collecting, analyzing and interpreting that data. The measurement of system performance through the development and use of appropriate indicators and measurement strategies is key to accountability. Methodological, data-capture feasibility, and interpretation issues are also extremely important if data are to be ultimately useful for decision-making.

Nationwide efforts aimed at addressing the issues of quality assurance, evaluation, measurement, and accountability in healthcare, generally, and mental health care more specifically, are extensive. Documentation of models and practical implementation guidelines with respect to such endeavors are also

plentiful[1]. However, although models and implementation paradigms may reflect some unique characteristics depending upon a specific focus, (e.g., public mental health service delivery, integrated services for homeless mentally ill persons, managed care, etc.), differences among the underlying visions with regard to demonstrating accountability are minimal. Moreover, there exists a relatively singular vision of comprehensive system transformation that includes person-centered, recovery/wellness oriented, culturally competent, effective, efficient service delivery; outcomes to be measured at the client, service system and community levels; and a simultaneous emphasis on the development of information technology infrastructures that are capable of supporting detailed, multi-modal information capture/distribution, and intra/inter-system data integration and/or interoperability.

The performance measurement design for Mental Health Services Act accountability reporting (described under separate cover) and its supporting information technology infrastructure are consistent with the above vision. The present document describes the vision for an underlying information infrastructure framework, as well as an initial plan/timelines for working toward that vision. The vision and plan/timelines described in this document reflect DMH's priority for MHSA information technology funding. Significant planning, and development of strategies for design and adoption are underway in order to arrive at both appropriate accountability indicators/methods, and to flesh out strategic actions that will maximize advancement toward the information technology vision. Planning, designing and adoption of strategies will be accomplished with guidance from counties who will implement these changes, as well as other stakeholders, in order to ensure both successful implementation and ongoing success of this accountability enterprise. Outcomes measurement and information technology development implementation strategies will incorporate evaluation models with demonstrated success, will draw from experience with legacy information management systems, and will integrate the newest technological advancements for information access and system interoperability.

INFORMATION TECHNOLOGY VISION AND FUNDING PRIORITY

In California, the transformational goals of the Mental Health Services Act necessitate a comprehensive information technology infrastructure and widespread adoption of data standards developed through multi-stakeholder participation. The importance of information technology and the adoption of information management standards to the advancement of quality healthcare and mental health transformation are also underscored by the President's New

[1] The following are a few examples: President's New Freedom Commission Report on Mental Health, MHSIP Quality Report, Decision Support 2000+, Crossing the Quality Chasm – The Quality Chasm series, CMHPC outcomes, Realignment Legislation, CSOC Legislation, and AB2034 Legislation.

Freedom Commission recommendations,[2] the US Department of Health and Human Services' "framework for strategic action"[3], the Institute of Medicine's (IOM) Quality Chasm Series framework for quality healthcare[4], the Health Statistics Vision for the 21st Century[5], and the National Health Information Infrastructure (NHII) vision[6].

The major purposes of mental health information systems are:

- Electronic information capture and distribution to improve services & mental health - Using electronic systems for improving service delivery, and access/security of mental health information (e.g., Electronic Health Records [EHRs], Personal Health Records [PHRs], information access networks).

- Resource management - Allocation, appropriation, funding stream & workforce tracking, cost reporting, Medi-Cal claiming, billing etc.

- Performance measurement –
    - Oversight: assuring appropriate, state-of-the-art service delivery (e.g., Evidence-Based Practices [EBPs], value-based/promising practices, etc.)

    - Evaluating effectiveness: examining consumer and community outcomes in the context of services and supports provided/ available.

Unfortunately, electronic information capture is often compartmentalized and redundant, and the resulting data are siloed, so that information is not accessible or retrievable in a comprehensive or relational way. For example, Client and Services Information (CSI) reporting, Medi-Cal claiming, Federal Uniform Reporting System data, state hospital and long term care information, cost reporting, other funding stream accountability mandates, consumer survey reporting, key event tracking (e.g., AB2034 outcomes reporting), oversight and fidelity processes (e.g., progress note/claims association), and human resources

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[2] The President's New Freedom Commission on Mental Health. (2003). Achieving the Promise: Transforming Mental Health Care in America: Final Report. Rockville, MD.

[3] Thompson, T. G., & Brailer, D. J. (2004). The decade of health information technology: Delivering consumer-centric and information-rich health care - framework for strategic action. Retrieved November 15, 2004, from http://www.hhs.gov/healthit/documents/hitframework.pdf

[4] Daniels, A.S. & Adams, N. (2004). From Policy to Service: A Quality Vision for Behavioral Health: Using the Quality Chasm and New Freedom Commission Reports as a Framework for Change. Pittsburgh, PA: American College of Mental Health Administration.

[5] Department of Health and Human Services Data Council; Centers for Disease Control and Prevention, National Center for Health Statistics; & National Committee on Vital and Health Statistics. (2002). Shaping a mental health statistics vision for the 21st century: Final report. Retrieved November 15, 2004, from http://www.ncvhs.hhs.gov/hsvision/21st%20final%20report.pdf

[6] National Committee on Vital and Health Statistics, Workgroup on National Health Information Infrastructure. (2000). Toward a national health information infrastructure interim report. Retrieved November 15, 2004, from http://www.ncvhs.hhs.gov/NHII2kReport.htm

information seem to be distinct and separate projects. Their purposes, as well as their business processes, operations and reporting appear isolated, even though they are intrinsically related.

The vision is, therefore, one of an over-arching, interoperable, data capture system with the goal of streamlining, integrating and coordinating business processes, technology and information. There are three areas in which coordination and integration need to take place.

1. Coordinating and Integrating Data-Informed Projects:
   - Conceptually and operationally tying goals, data needs and business processes together; reducing conceptual stovepipes and data redundancy.

2. Creating integrated & coordinated computer / communications technology solutions:
   - Achieving interoperability between disparate systems, components, databases, etc.
   - Streamlining the user experience by developing intuitive, seamless, and transparent processes; reducing data entry redundancy.

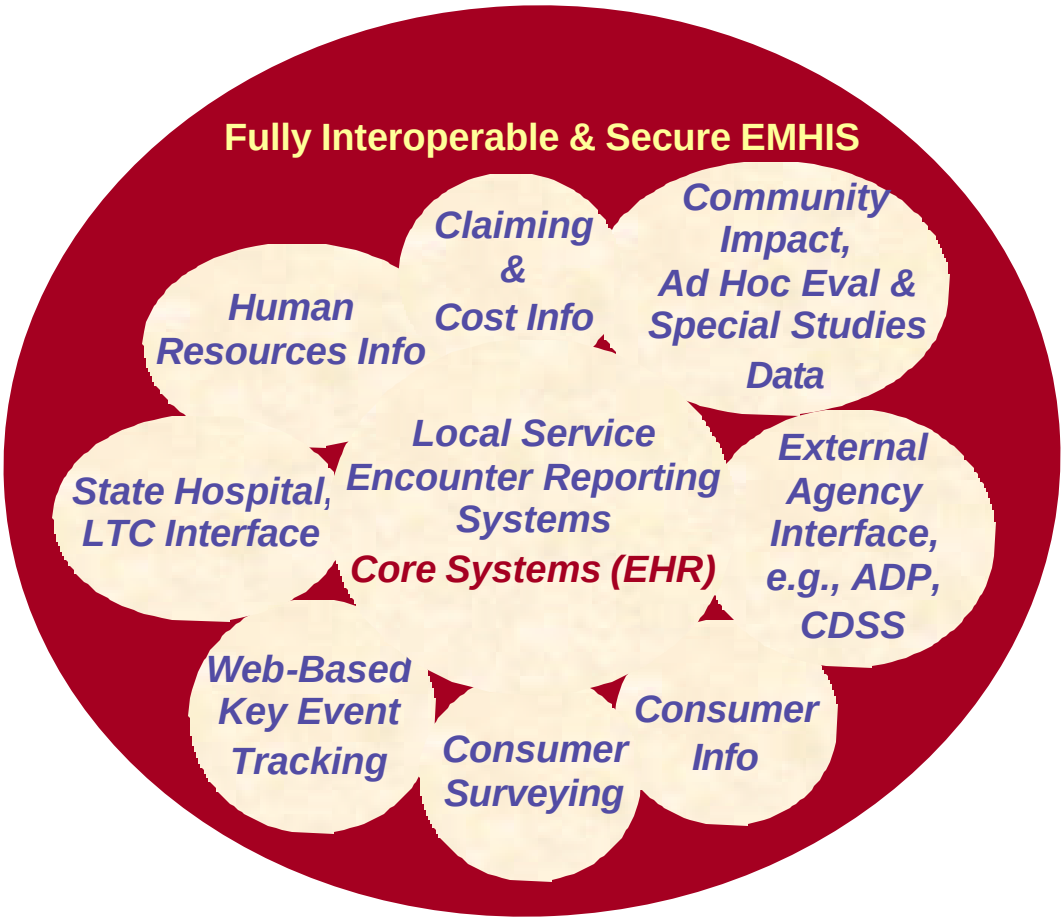
3. Integrating resulting data for performance-based accountability:
   - Combining typically isolated data silos in order to measure meaningful indicators, e.g., cost-effectiveness, differential service outcomes, etc.

Our current focus is on number 2, above, which DMH sees as the priority for MHSA IT funding. ***Information technology allocations will be directed toward the development of enterprise information technology solutions that are consistent with the longer range vision for electronic health record capability and provider/county/state inter-system interoperability.*** In order to create an integrated and coordinated computer and communications technology solution, DMH is emphasizing:

- Development of technology, data and measurement standards
- Ensuring flexibility (options, as well as flexibility to change) to ensure feasibility
- Building on what is already there; Integration through systems interoperability

DMH and California counties have legacy management information systems that capture service encounter and client data, as well as more recently developed web-based systems with outcomes reporting capabilities. Rather than embarking on the development of a single, omnibus and centralized system, an approach that emphasizes interoperability, flexibility, and adapting current systems and processes to a multi-purpose electronic mental health information system is preferred. The concept of *adaptation* – improvement in relationship to the

environment – in contrast to the term *adoption*, often used with respect to electronic health record implementation (i.e., EHR adoption) is consistent with the Mental Health Services Act (MSHA) transformational intent. Multiple systems that can be adapted to work together increase the feasibility and flexibility of the system, and ultimately, its utility and success. The diagram below shows a core, electronic mental health encounter and record system (EHR) surrounded by interoperable components (previously silos) that combine to form a secure and fully interoperable electronic mental health information system (EMHIS). More information on this vision in presented in Appendix A.



STRATEGIC FRAMEWORK AND PHASED IMPLEMENTATION

The technology enterprise solution is envisioned as a flexible, secure, distributed system for data capture (according to established standards) at the county/local mental health service provider level - coupled with a coordinated information management approach designed to interface with and integrate data from distributed locations (e.g., county servers, staging databases). Through system interoperability, DMH and counties/local providers would record and exchange information. For example, data could be "pulled" from county/local servers

and/or staging databases, and then data/reports could be "pushed" back in virtually real time, or at established, effective intervals. Another example is a DMH-developed web-based client outcomes tracking system that can be interfaced with local/county service tracking/record systems, in a streamlined manner for the end user (e.g., clinician, support staff, etc).[7]

With current technological advancements, this type of interoperability is feasible, but requires considerable planning, prototype development, and a phased implementation process.

Phase I

In order to meet the imminent services and performance reporting needs for the Mental Health Services Act (MHSA)[8], consistent with the start of local/county community services and supports delivery, DMH will provide a prototypical data capture/reporting system. Counties will be asked to pilot test this prototype system for MHSA full service partnership clients and for Federal Uniform Reporting System (URS) - Data Infrastructure Grant (DIG) data changes. Results from this pilot test will be used to determine feasibility of the system for data capture for all clients served statewide, within an interoperable infrastructure (described above). The development of this prototype is considered Phase I, and is scheduled to be completed by April 2006.[9]

Phase II

During the next year, DMH will be working with counties to streamline information technology efforts statewide in order to most efficiently design and work toward achieving an interoperable infrastructure. Development of such a system will require collaboration between DMH, counties and information technology experts. Goals of this collaboration include specifications regarding electronic client record systems, and development of networks and internet-based architectures for interoperability. Counties will be expected to work with DMH and information technology vendors to assess current and potential new system capabilities/functionalities with respect to specifications regarding interoperability, and data and system standards.

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[7] In order to fulfill the vision of interoperable electronic health record systems, distributed data entry by authorized individuals, including service providers, professional staff (e.g., clinicians), service recipients, etc. must be embraced. This may reflect a business process shift for some, but in the modern, advancing, data-driven era, it is most desirable. The EHR vision is inconsistent with the concept of numerous clerks entering large amounts of data from paper charts, and favors, direct electronic information entry by those closest to and most knowledgeable about the information.

[8] DMH will be emphasizing the capture of accurate and uniform (1) assessment, service, process, and outcome data at the individual client level; (2) oversight, monitoring and client perception information at the system accountability level; and (3) mental health promotion, system structure/capacity, population data, and community reaction information at the public/community impact level. Strategic steps will be employed to address the data capture, data access, and reporting needs reflected in this tri-level performance measurement paradigm. The Phase I prototype is being developed for the individual client level (number 1).

[9] Should a county begin MHSA services and supports prior to April 2006, DMH will provide paper forms or other methods for interim data capture, and will coordinate with the county to determine the best means of meeting reporting needs.

For this phase, counties will be expected to submit an information technology plan that addresses how MHSA information technology dollars will be spent toward increasing compliance with data/technology standards and interoperability. Information technology plans (information technology dollars) should not focus (be spent) on replacing current local/county billing system functionality, nor on staff computers, laptops or other devices for staff business operations. (Cost of staff computers, etc. should be included in the Community Services and Supports budgets.) Rather, information technology dollars should be directed toward system solutions that can achieve inter-system interoperability and that are consistent with longer-range electronic health record development initiatives. For county long-range planning purposes, ideal characteristics of information technology solutions and a preliminary discussion of the use of XML (Extensible Markup Language) in systems design are described in Appendix B. Counties should also consider network capacity and bandwidth issues; most information technology infrastructures will require considerable network capacity in order that systems are functional and accessible within a distributed solution.

An information technology plan requirements document, which includes a timeline and outline of minimum specifications for short-term system interoperability is in the process of being developed. DMH is aware that counties may be updating current information systems, and these short-term specifications should be part of those systems. However, it is important to note that the realization of the vision of a fully interoperable mental health information system (as described herein) is likely to be five or more years in the future, accomplished through an iterative and continuous improvement process. The vision does not represent a static system design to be achieved, but rather a flexible, adaptable, and transformational process that makes the best possible use of modernizing technologies to achieve mental health system accountability objectives.

Appendix A

Vision for Interoperable Electronic Mental Health Information Systems

Current technologies provide the opportunity to track client and service indicators securely and specifically, while also providing an infrastructure for data aggregation and consolidation for broad-spectrum analysis. At the individual client level, the information capture would be best accomplished through an electronic mental health record (EHR), capable of recording services, as well as multiple measurements of important individual, client-level changes, outcomes, quality of life indicators, and other issues across meaningful periods of time. Through an electronic record system, there is the potential to easily and continuously document on relevant progress and outcome indicators, code and consolidate the information, and interpret it in meaningful and useful ways.

The electronic mental health record in conjunction with other interoperable components of a comprehensive information infrastructure would allow client progress/outcomes to be evaluated in relation to other important system and community impact level information (e.g., fidelity to evidenced-based models, capacity and access issues, etc.) As a result, the potential differential effectiveness of various service models/strategies on client outcomes would be identifiable. Furthermore, the effectiveness of current programs could be compared to new and innovative programs developed through the Mental Health Services Act (MHSA).

The ultimate vision for an interoperable electronic mental health information system would involve real-time reporting of service and billing/claiming information, assessment, correspondence, treatment planning, charting, medications, outcomes, referral, etc, and would function as a multi-user, multi-disciplinary, multi-functional, and multi-modal (i.e., multiple types of information, including text, images, etc) enterprise. Clients, providers, caregivers, and appropriate others could use the system, and enter and receive information – ***all governed by access rights and security standards established by confidentiality and privacy laws***. For example, with a comprehensive electronic mental health information system, client engagement, services received, outcomes, and disengagement would be easily tracked. The system could also be used by inter-disciplinary teams and partnering agencies (e.g., criminal justice system, social services, alcohol and drug services, etc) to improve coordination of services and supports on behalf of clients/families. Long term system goals include (1) on-line means of monitoring, tracking and updating program/system oversight information, (2) integrating service, client and human resources information – for monitoring of client to staff ratios, and examination of the relationship between staff competencies and client needs and outcomes, and (3) assessment and tracking of broad-based community strategies including outreach, prevention, media-education, and mental health awareness and anti-stigma/discrimination campaigns.

The system would contain underlying coding capability, so that data could be numerically stored and aggregated. An electronic mental health information system of this type has the potential to provide large amounts of longitudinal, comparable data, that can address quality issues and provide guidance in personal, clinical, and administrative decision-making.

The conceptual starting point for the interoperable information system vision resides with the current service encounter/billing and performance outcome systems.[10] For example, the core electronic health record (EHR) in the diagram above, can be conceptualized as an extension of the type of data reported to the Client and Services Information (CSI) System periodic record. This EHR concept would be combined with interoperable means of collecting client-level outcomes information, through survey reporting processes (e.g., Performance Outcomes and Quality Improvement Web-Based Reporting System) and key event tracking (e.g., AB2034), as well as other information. Therefore, the initial plan toward interoperability involves adaptation of current system concepts to a comprehensive information system conceptualization. The conceptualization also includes a great degree of system flexibility. Information needs are continuously changing and the system must be capable of adapting to changes in data elements and data capture methods/time frames at minimal cost and complication, within a standardized, maintainable infrastructure.

The technology vision therefore includes use of modern methods of networking and web-based technologies to develop and uniformly update electronic mental health information systems. A flexible means of creating and sharing common data and information formats is discussed briefly in the Appendix B, below.

[10] DMH is not expecting short-term implementation of electronic health record (EHR) systems. The implementation of such systems should be addressed within the timelines stipulated by State and Federal requirements/guidelines. The EHR system is discussed in this document in order to describe its position within the overall vision of a fully interoperable electronic mental health information system.

Appendix B

Ideal Characteristics of Adaptable/Transformational Information Systems

The following are ideal characteristics of potential information systems toward which DMH and counties will be working. An adaptable/transformational system should be:

Flexible: The system should be able to change data structures, requirements, information acquisition methods and tracking on an ongoing basis.

Extensible: The system should be scalable for both small providers and large county systems. There must be "open" system architecture allowing new features and functions to be added or plugged in at will.

Interoperable and Secure:
The system needs to operate and interface easily with other systems. Information must be protected for privacy at all times.

Responsive: Information should flow into the system in an "as soon as gathered mode" rather than weekly, monthly, etc. intervals. Business requirement changes must flow into the system as needed.

Preliminary plans for the use of XML in adaptable/transformational system design:

XML (Extensible Markup Language) may be useful in developing transformational information systems. XML is a self-describing data structure that provides a flexible way to create common information formats and share both the format and data between counties and the state in a consistent way. Because XML data structure is not dependent on any particular data format, length or order, it can make use of data from different types of systems, databases, and programs. Through XML, schemas (data codes and rules) can be automatically applied to allow data to be validated, displayed, distributed and stored in numerous and flexible ways. Automated XML tools are available to generate schemas that change views and interfaces for distributed users, without need for changes to applications. This allows great flexibility, as centralized formats and changes become automatically accessible to all who are part of the system. More information on XML may be found at *www.w3schools.com*, *www.htmlgoodies.com*, and *www.whatis.com*.

DMH will provide an initial XML schema-based application for county use (Phase 1, also described on page 8):

- Centralized, schema-based web pages allow entry online for all new Mental Health Services Act and Federal Uniform Reporting System (Data Infrastructure Grant) system information.

- Printable forms may be available from the web, which can be scanned in to populate the web-based form(s).
- Counties could build custom web-based forms using the provided XML schema, if desired.

DMH to build a schema-based information portal:

- XML information can be sent from the county/provider via secure file transfer protocols.
- Plug-ins could be developed for county/vendor systems to access county files and extract/send information.
- A staging database could be created where county information would be stored for access and processing.

Mental health information to be available via an access portal:

- DMH will build a web-based reporting and charting site.
- DMH will provide downloads of selected county/provider information via XML files and reports.
- The XML process can automatically return incoming raw information directly into staging databases at the county level.
- Reports and analyzed information can be returned to county/vendor applications for access and processing by the county.